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umn. One had no correct responses in the deutan column, the other had only one. There was a five point difference between the IQ's of the two siblings.

In another instance, the examiner tested five children from the same family (4 boys, and 1 girl). Three of the boys were diagnosed as having defective color vision. The breakdown of their examination record sheets follows.

Table II.					
	Protan Column	Deutan Column	Tritan Column	Tetartan Column	IQ Level
Child A	0	3	0	2	60
Child B	0	8	4	4	61
Child C	0	6	4	4	63

Only the correct responses are listed above.

The three of the five siblings (see Table I) that were diagnosed as having defective color vision, had brown eyes. The other two, who had normal color vision, had blue eyes. There were other instances where siblings who were in Special Classes differed in that one of them had defective color vision while the other did not.

Adaptation as Related to the Introversion-Extroversion Dimension¹

EARL D. SCOTT AND DAVID WILKINSON

Abstract. Thirteen young adult men were given a test for introversio-extroversion. They were then tested to determine the number of presentations of a noxious stimulus which was required for adaption to the stimulus to take place, as measured by the galvanic skin response. It was found that extroverts adapted with significantly fewer stimulus presentations than did introverts. The results were related to Eysenck's theory concerning the introversion-extroversion dimension and conditionability.

Pavlov's (1927) theory of cortical functioning emphasized two basic cortical processes, excitation and inhibition. In his work with dogs, he noted that some animals were easily conditioned while others were extremely difficult to condition. He postulated that this was due to a difference in the balance of excitatory and inhibitory potentials in different animals. In some dogs where the excitatory potential was dominant over inhibitory potential, the conditioned response was easily established, but difficult to extinguish, while in those animals in which the inhibitory

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potential exceeded that of the excitatory conditioning was found to be difficult, but extinction took place rapidly. In later years Pavlov attempted to apply these notions of inhibition and excitation to psychiatric classifications. Thus some neurotic or psychotic patients were said to have developed their particular type of difficulty because of this excitatory-inhibitory balance.

In more recent years, Eysenck (1960) and his associates have related excitation and inhibition to the Jungian personality types of introversion and extraversion. According to Eysenck, the introvert would be an individual who reacted strongly to stimuli around him, he would be very easily conditioned, and the extinction of a response would be prolonged. This sensitivity to stimuli and reactivity to it would result in the person withdrawing from situations which would present excessive stimulation. The extravert, on the other hand, would be little affected by most stimuli around him. For the extrovert conditioning would be slow and extinction rapid. He would be relatively insensitive to many kinds of stimuli and therefore, would be able to function in many situations which the introvert would find intolerable.

Studies have been carried out by Franks (1956) and others which indicate that individuals who are rated as introverts, do in fact condition more readily than those who score as extroverts. Eysenck maintains that because of this resulting ease of conditionability for the introvert, he incorporates the rules of society much more readily than is the case for the extrovert. In fact, the introvert might be termed "over-socialized." Whereas, the extreme extrovert would be under-socialized; in both instances the result coming about basically because of the different types of nervous system, which in turn determine their susceptibility to learning in a wide variety of situations.

Since excitability and reactivity, especially autonomic reactivity, have been stressed by Eysenck, it follows that if subjected to an unpleasant stimulus which was capable of evoking an autonomic reaction, the extrovert should adapt much more readily to the stimulus than would be true for the introvert. It was therefore decided to carry out an experiment in which individuals would be subjected to an unpleasant stimulus, a bright light, and to correlate their scores on an introversion-extroversion scale with number of stimulus presentations required for the subjects to become adapted to it as measured by the galvanic skin response.

METHOD

Subjects: Thirteen male Psychology students at Cornell College, ranging in age from 18-23, with one exception, served as subjects in this experiment.

Apparatus: and Procedure: All subjects were given the Eysenck Personality Inventory. This scale has been developed by Eysenck to measure both introversion-extroversion and neuroticism. It also contains a Lie Scale. When the subjects reported for the experimental session each was directed to read the instructions for the EPI, Form A, which was on the desk, print their name and date, turn the instructions over and take the test. The experimenter was not in the room while the subject took the test. No subject was included in the experiment who received a score of more than four on the Lie Scale. On concluding the inventory, which took approximately five minutes, the subject was taken into the experimental room and seated at a table which held a sound conditioned booth, 3 x 2½ x 2½ feet. This booth was open at one end and extended beyond the table, so that when S was seated his head and upper part of his trunk was well within the booth. On the table approximately two feet from his face was an unfrosted 200 watt light bulb which was the source of the noxious stimulus.

During the experiment *E* stayed in an adjoining control room which contained the experimental equipment, which consisted of a Yellow Springs Instrument Co. Dermohmmeter, for measuring the GSR and an Esterline-Angus Recorder which provided a continuous record of the GSR and the stimulus event marker. Also in this room was the Meylan recycling cam timer which controlled the stimulus presentation.

The experimental room was sound-deadened and contained a one way window through which S was observed throughout the experiment. It allowed *E* to interpret variations in the GSR that were caused by the movement of the S. A microphone on the ceiling of the experimental room enabled the *E* to hear all sounds coming from the subject. The subject could neither see nor hear the experimenter during the experiment proper. A door separates the experimental from the control room; this door was shut during the adaption period.

After taking the personality inventory and being seated at the table in the experimental room, the GSR electrodes, containing electrode paste, were fitted on the S's left hand, and the S was told that certain physiological responses were to be measured. The S was then given the following instructions:

"The following experiment will take fifteen minutes, during which time you must remain as still as possible. It is therefore essential that you get in a comfortable position before the experiment begins. Your eyes must remain open at all times. The electrodes on your left hand are for measuring electrical resistance of the skin. Please do not disclose anything about this

experiment to anyone. There will be no electrical shock associated with the experiment *at all*."

The S was also instructed that upon the experimenter's leaving the experimental room, he would ask six questions through the open door. These questions were presented to allow S to adjust to the experimental situation and permit E to make final adjustments on his equipment. The questions were: (1) How old are you? (2) What school do you go to? (3) What class are you in? (4) What dorm do you live in? (5) Where does your family live? (6) Where did you go to high school?

At the conclusion of the questions the door to the control room was closed, and the timer was turned on, thereby starting the 20 trials of adaptation, with the stimulus light flashing on for one second out of every thirty-six. The experiment began with thirty-five seconds with the light off, and at the end of this period the 200 watt light flashed on for one second. The criterion for adaption was three consecutive presentations of the stimulus light with a GSR change of 300 ohms or less. If the subject reached the criterion before the 20th trial, no additional stimulus presentations were made.

From the above discussion it would be predicted that Ss having low EPI scores (introverts) would require a relatively large number of adaption trials.

RESULTS AND DISCUSSION

The scores obtained by the subjects on the EPI were compared to the number of stimulus presentations required for the GSR to meet the criterion of adaption. EPI scores could range from 0 to 24, while the number of adaptation trials could range from 0 to 20. The scores obtained by Ss on these variables is shown in Table 1.

To determine whether there was a relationship between introversion-extroversion and adaptability to a noxious stimulus, a Spearman rank correlation coefficient (Siegel, 1956) was computed, with a resulting rho of $-.75$ ($p < .01$). Thus, this highly significant inverse relationship supports the prediction in agreement with Eysenck's theory that extroverts would adapt to a strong stimulus more rapidly than introverts. The two subjects receiving the highest introversion score never adapted at all, while subjects receiving the highest extroversion scores adapted to the stimulus in 3 to 5 trials.

These results suggest that one of the reasons for extroverts being difficult to condition is their rapid adaptability. If the experimenter had been using the strong light as an unconditioned stimulus in a classical conditioning experiment, the extreme

Table 1. Subjects scores on the two variables

Subject	EPI Score	Trials to Adaption
A	4	20
B	4	20
C	10	9
D	10	7
E	11	8
F	13	15
G	13	11
H	13	6
I	14	10
J	15	9
K	16	5
L	17	3
M	18	5

extroverts would, in effect, have received only 3 to 5 training trials during the 20 presentations, whereas, the extreme introvert would have received 20 training trials. Should adaptibility to other stimuli take place as it did to the strong light, this factor could partially account for the ease with which introverts as compared to extroverts are conditioned.

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